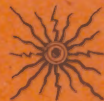


DU BOIS-REYMOND (E.)

No. V.



Swedish Gymnastics and German Gymnastics

FROM A PHYSIOLOGICAL POINT
OF VIEW.

By Prof. Emil du Bois-Reymond of the University of Berlin.



Milwaukee, Wis. : FREIDENKER PUBLISHING CO., 470 E. Water St.

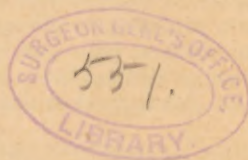
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Can a satisfactory state of bodily development be reached speedily, or even at all, by exercising certain muscles or sets of muscles? If this question is answered in the negative, the Swedish system, of course, cannot stand. But even though the answer be in the affirmative, the question would still not be settled; for it would yet be open to discussion which of the two systems should have the preference, since without any doubt the highest degree of physical development is attained by the German system.

So far as I am aware, we will be the first to answer this question from a physiological point of view. It cannot be seriously claimed by any one that Ling established the correctness of his system. Scanning his writings it can easily be discovered that he argues on a line with that exploded philosophy which kept German science in disgrace for a quarter of a century. Only the superficially educated, to whom arbitrary constructions, a meaningless symbolism, a dry mechanism, a pedantic terminology, a few anatomical-physiological morsels appear as profound science, and to whom the errors are not apparent, can be

N. B.—This essay was written in 1862, after the Prussian Government had appointed Major Rothstein as Director of the Royal Central Institute, and he, a scholar of Ling, with the official backing of the government, was leaving no means untried to have the Swedish system substituted for the German. After a contest lasting for years Rothstein was forced to resign and German gymnastics once more held full sway in the Prussian capital. The arguments that Prof. Du-Bois Reymond used against Swedish gymnastics at that time hold good to-day.

duped thereby. Anyone who understands the purpose of science will only, with great reluctance, examine those writings in search of the valuable details which one would expect to find in those works, in which so honest yet confused an enthusiast as Ling, whose life was devoted to a subject of moment, records his experiences. But even in this he will be disappointed. The book contains only that which anyone could evolve from certain premises, and that, too, presented in a trivial dogmatic style. There is nothing in Ling's writings that will furnish a physiological answer to this question.

The voluminous production by the follower of Ling, Major Rothstein, director of the Royal Central Institute of Gymnastics of Berlin, resembles an immense curly wig, covering a tiny, hollow, brittle doll-head having sullen and haughty features. The doll-head is the narrow, hollow, rigid, easily punctured system of Ling, which is really the essence of the book, as we will see presently. The wig is the material, most diligently gathered from all sources, which hides the nakedness of the system, embellishes it, and gives it such an air of importance that, owing to the great number of details, one often loses sight of the real subject for a long time. Such philosophical, ethical, æsthetical, political, pedagogical, philological and theological effusions do not concern us here. As to the anatomical, physiological excursions, to which the reader is invited, I am sorry to say that they are utterly worthless. The anatomy consists only of a few little extracts from the Wilson-Holstein compendium. In the physiology the author mixes absolute perceptions and opinions with more modern facts and teachings in such a confused manner, that he betrays a perfect uncertainty of scientific judgment, as is not infrequently the case with laymen, who believe to be able to authoritatively enter a complicated field for a certain purpose. This causes a confusion which surpasses all conception, and one which would make an attempt at a thorough criticism of this subject very difficult, while it would on the other hand be easy for the author to compromise himself by quoting single sentences. Both might be equally unprofitable. Concerning the fundamental principle involved, the only answer that I can find is contained in the reference to Plato, and Ling's often repeated sweeping assertion, that all bodily exercises are the better for their simplicity, while German gymnastics is discarded on philosophical, ethical and æsthetic grounds. The claim that it is detrimental to health seems, for some unaccountable reason, to have been added later, although, perhaps on philosophical grounds alone, they did not find it justifiable to discard the parallel bars in the Central Royal Institute. Nor have I found a physiological treatment of that question in any literature pertaining to German or Swedish gymnastics. Privy Counselor Langenbeck intimates the following: "By the isolated exercise of single muscles or sets of muscles, the boy becomes conscious of the means by which he may avail himself for executing combined movements."

First of all the mistaken idea, that we can contract certain muscles at will, must be set aside. Although we may have a very good idea of the amount of exertion necessary to perform or cut short a movement, and for the direction in which this is done, yet in a healthy condition

we are not aware that we have muscles. If we contemplate a motion or exhibition of strength toward a certain object, we do this without taking into consideration the muscles which are to be brought into play. This is so true that most people are highly surprised when they discover that the fingers of themselves are motionless, but that the muscles which cause their motion are situated in the fore-arm. But the understanding of the existence and situation of the muscles does not change these conditions. The most thorough anatomist and physiologist, who is as conversant with his body, as the watchmaker with the watch, proceeds in the same manner as an uneducated person or an animal. Now it is customary that even the simplest movements, like bending and straightening the hinge joints, is not performed by the action of a single muscle, but by several muscles which are similar in their action. This is also true of the ball and socket joints when we wish to perform an exercise which requires a rotary motion. Therefore, if we design or perform motions, we can do so only by such groups of muscles, but never, as the opinion claims, by a single muscle.

Experience teaches us that muscles become stronger through exercise, and within a certain limit, they increase in size; muscles which are not contracted at times become weakened. The plan of developing the body by exercising certain sets of muscles methodically, giving regular practice to each single one, appears to be at the first glance quite reasonable. A closer examination, however, will show that this plan accomplishes too much on the one hand, and not enough on the other.

This method accomplishes too much on the one hand, because, in order to bring about the development of all the sets of muscles, it is scarcely necessary to exercise each one singly. In the case of a machine as is represented by the muscular system, a good result, in a certain direction, cannot in a general way be obtained without having many, if not all muscles, brought into play, even though not simultaneously. How many muscles are there for instance which are not brought into play at all in vaulting? The suitable arrangement of several such exercises furnishes an excellent means of avoiding tediousness, which is necessarily brought about by the systematic exercise of all single sets of muscles.

This plan on the other hand, and this is the principle point, accomplishes too little, for it is not the sole purpose of bodily development to give to all single muscles the highest degree of strength. I can picture to myself a person possessing the muscles of a Hercules who would not be capable of walking or standing, much less of performing complicated exercises. It would only be necessary for me to rob him of the power to properly control his movements, to bring about his intoxication for instance.

This makes it clear that the work performed by the body, as an apparatus of movement, is as essentially dependent upon the correct co-operation of the single muscle groups, as upon the strength necessary to contract them. In order to perform a complicated movement, for instance a jump, the muscles must begin to work in the proper order of succession, and their energy in the sense of Helmholtz must

increase according to a certain rule, sustain itself, and relax in order that there may result a correct position of the limbs, and that the changing of the center of gravity be effected rapidly and in the proper direction.

In addition to this, in all such complicated exercises, the use of the two senses, sight and touch, are necessary to quickly comprehend the situation at any moment, and the mind must be prompt to decide what must be done in accordance with the message of these senses. All forms of bodily skill, such as dancing, skating, riding, swimming, fencing, etc., depend in the end on a complicated activity and on the suitable interaction of impressions obtained through the senses of which we are only partially conscious. All these accomplishments, therefore, pertain equally as much to the nervous system as to the muscles, and the skill acquired therein, as is well known, bear no relation whatever to the absolute strength of the muscles. The same is true of gymnastics. Most people entertain the erroneous idea that gymnastics never is anything but an exertion and exercise of the muscles, because these are the more noticeable parts of the body in motion and their existence and action are more easily understood. But all gymnastics is as much exercise for the nervous system as for the muscles. The failure to recognize this second feature of all physical culture is the unpardonable fundamental error of the Ling system, and this alone suffices to prove that from a physiological point of view it is worthless. However long anyone might exercise the muscles according to the Ling system of gymnastics, he would be inferior to the average German gymnast, who from the beginning has combined the gymnastics of the nerves with the gymnastics of the muscles, in case they should find themselves confronted by any actual task, the successful performance of which depends upon a suitable use and control of the muscular powers before fence and ditch, on rock or wall, among the branches of the trees, amidst the rigging, wherever a sharp eye and clear head are required, and where it may be necessary to alternately use the foot in place of the hand and the hand instead of the foot. The body developed according to the Ling system will always remain a mere aggregate of bundles of muscles, resembling an irregular throng of stout warriors; but the body trained according to the German system presents the picture of a well-organized, well-drilled army, obedient to every command, the single elements of which need not, for that reason, be lacking in strength. Suffice it to say, when we probe the matter, the so-called rational system of gymnastics proves the exact opposite of what it claims to be, as is so often the case where such claims are raised; it is essentially irrational.

Privy Counselor Langenbeck is certainly familiar with the physiological foundation of these statements. The exclusion of the combined movements he himself designates as an aim, which he hopes to reach by the Swedish system. The last censured defect of this system has therefore not entirely escaped him, as he seems to consider it only an introduction to a combination of exercises. What combined exercises he has reference to, is not known, because he discards the German system. But no matter. If it is true, in the first place, that manifold

combined movements suffice to give each single set of muscles an adequate amount of exercise without systematic practice of all of them; if, in the second place, it is true that the mere practice of single sets of muscles does not make the body capable of executing combined movements, but that these, in addition thereto, must receive special attention, then it follows unquestionably that the Swedish system of gymnastics is almost equal to a perfect waste of time in the physical education of the youth.

Ten years before Ling and his system were heard of in Berlin, every lesson was begun in the Gymnasium of Eiselin with the so-called exercises of the joints, which were in reality calisthenics. For beginners these exercises constituted the first course, and for the more advanced they formed a graded introduction for the more difficult requirements, and for all a guide to exercises which could be continued daily, even in the room without apparatus. As these exercises were carried on by many conjointly, they furnished an opportunity of developing prompt obedience in the rank and file of the participants. Finally, inasmuch as they gave systematic training to the human body in the fundamental movements, they served to supply the defects, which were perhaps contained in the complex exercises, in regard to the uniform exertion of all the sets of muscles. Such exercises have not only since that time been continually practised at the different German gymnasiums, but have even been more fully developed so far as was consistent with the increase in the number of beginners. Great consideration was also shown, according to my opinion unnecessarily, to the adherents of the Swedish system, as though the German system were defective as regards the uniform development of the body. These German exercises of the joints are not mentioned by Privy Counselor Langenbeck. To the extent demanded by the German system, these exercises fully accomplish the task which he deems necessary in the Swedish system, namely, to accustom the undeveloped body to the exercise of single sets of muscles before more difficult tasks are required. The German system, however, does not, like the Swedish, keep the scholar forever at this preparatory work, but allows him, even in the first lesson, to pass on to some exercise of a more advanced nature in which he may take a delight.

This brings us to the other fundamental error of the Ling system, which shows the founder to be as poor a pedagogue as a physiologist. "The Swedish system of gymnastics in its purity, could not be recommended exclusively for the bodily development of our youth. For delicate children it is too severe, on the other hand, it is not sufficiently animating and fatiguing for older ones. Even boys wish to accomplish something through their efforts and to advance in their work. This is not realized in the practice of the Swedish system, because they cannot as yet comprehend the various positions and movements."—"The Swedish gymnastics may be sufficient to strengthen the single muscles and the entire body, it is not adapted, however, for rendering the youth conscious of his own strength and courage, and realizing that physical dexterity which is of such importance for life." In these words Privy Counselor Langenbeck himself exposes as mercilessly as

the most pronounced antagonist of Swedish gymnastics, the lamentable psychological foundation of the Ling system. It remains to be added, that really only the sick, for the sake of their health and at the command of their doctor are able to bear the terrible monotony of the "rational gymnastics." Everybody knows the fate of Swedish gymnastics. In spite of the grand theories to which it owed its origin, no dog could be coaxed from behind the stove by it, as we sometimes say in German. And as the first teachers of Christianity often found themselves compelled to wink at the retention of heathenish customs, but gave them a meaning in conformity with their own doctrine, in the same manner the follower of Ling—Rothstein—in spite of the contempt with which he was filled, in the beginning, toward all exercise on apparatus, allowed himself, in order to infuse life into the monotony of Swedish gymnastics, to incorporate in his teachings much of the German gymnastics, although in another shape and under a different name. For this reason a Prussian gymnasium no longer differs very much in appearance from a German, but shows very plainly how difficult it is to improve on something good.

As to the selection of German exercises, which are allowed there, we understand it is done "upon the basis of the highest theoretical principles." It is required of these exercises "that they be in manifest relation to the moral reality or the idea of man. The unity of nature and spirit, manifesting itself as a reality in the human being," is emphasized, where in reality the only point is to give the boys rosy cheeks and strong limbs. An appeal is finally made to anatomy and physiology, "without the knowledge of which the gymnast pursues his calling in the dark;" and we know that Dr. Abel considers it necessary to sift the bar exercises in a scientifically critical manner, grounded upon a physiological basis, in order that the parallel bars may be retained in the gymnasium without detriment to the health of man.

This is a matter of which perhaps I am capable to judge. My own experience with German gymnastics, extending over a large number of years has made me conversant with the same, and as a physiologist I have given my special attention to a study of the motions of the body. In the foregoing I have endeavored to show what the conclusions must be concerning the fundamental idea of Swedish gymnastics according to physiology. This idea is wrong in every particular. Should any one ask me to pass a scientifically critical opinion upon the parallel bar exercises, from a physiological standpoint, I should have to admit that I would be placed in an embarrassing position. I confess that I am not able to form an adequate conception of the meaning to be conveyed. I can conceive only of this, that Dr. Abel desires every parallel bar exercises to be analyzed in such a manner that the share of each muscle in the exercise is to be recorded as a function of time, in order that he might therefrom decide as to the suitability and compatibility of such exercises.

Should that be his idea, I doubt in the first place whether he has a conception of the nature and difficulties of such an analysis. The truth of the matter is that such an analysis leads to the most intricate and tedious discussions, even when applied to much simpler movements,

such for instance as a swing forward or backward on the parallel bars. These discussions would require the most exact knowledge of the anatomist and the most complete understanding of analytical mechanics, and they have been entirely eliminated from the study of physiology, because their consideration was not attended by proper results.

In the second place, I doubt whether Dr. Abel could make any use of such an analysis, even if there were one. I have at different times exercised with professional anatomists and physiologists through an entire term at the Gymnasium of Eiselin. I can't recall that any opportunity presented itself to apply our theoretical knowledge to the exercises in which we vied with each other, because there exists the same chasm between such views and exercises as there is between theory of voice and singing. A knowledge of the muscles and nerves, the combination of forces, and the classification of levers unquestionably assists the teacher of gymnastics in the same manner that an understanding of John Mueller's doctrine of the compensation of the forces of the larynx is of benefit to the instructor of vocal music. The teacher of music is not thereby enabled to tell his scholar how he is to proceed in order to produce a certain tone, and in the same way the anatomic-physiological knowledge is of no avail in the gymnasium. If the apostles of Ling wish to impress upon us that they can accomplish something of importance in this way, it is probable that they deceive themselves; at all events, they will cause professional men, such as Edward Weber, Herman Meyer, Adolph Fick and others, to laugh incredulously at their assertions. But if this be not the case, why do they never go beyond the use of such common places? Why do they not give us a proof that these exercises on the bars can be classified in a scientific and critical manner, on a physiological basis, instead of discarding the bars which, of course, is the easier thing to do?

In order to detract from the exercises on the apparatus as compared with calisthenics, it is asserted that no people has so completely reached the object of gymnastics as the Greeks, who were familiar only with calisthenics. How can you reconcile with this the importance which "rational gymnastics" ascribes to the anatomic and physiologic origin of their exercises, or what did the Greek gymnasts do who knew nothing of anatomy or physiology to keep from being lost in the dark?

It may seem strange for a physiologist to consider his own science of less practical importance than those who are not proficient therein and that he should oppose any appeal to the same. But a more profound knowledge, if I may be permitted to use this expression, often makes one modest, whereas he who has a smattering only, is puffed up with conceit; and that which is revered as of the greatest value, we most dislike to see abused for the purpose of giving a weak cause the appearance of solidity, and of imparting to empty statements an air of seriousness.

There are two ways, says Abbe Galiani, of determining the contents of a bowl. You will either have to send the bowl to a mathematician who will make certain measurements and computations, and possibly after a half year will be able to hand you the final equation

filled with unknown quantities which, however, may prove to be incorrect; or you will simply have to place the bowl in a horizontal position and making use of a measure, fill the same, and you will have the solution.

Many human affairs are like calculating the contents of a bowl, and this is the case with gymnastics. It is laughable to bring forward exuberant theories, when simple experience meets every requirement. The discovery and arrangement of bodily exercises does not depend upon theorems, upon anatomy and physiology. We are endowed naturally with all the knowledge of anatomy and physiology that we need, and this will no more desert us in gymnastics than in any other bodily action in which science is of just as little use.

Nothing can be more foolish than to prohibit any bodily exercise which can manifestly be carried out without incurring any risk, because they do not conform with pre-conceived opinions. I must admit that I agree absolutely with the observations of the Gymnastic Council of Berlin in its second memoir. That which the body is capable of doing is reasonable, and the body only can set itself limits. In answer to this it has been claimed on the side of the apostles of Ling that, in language study, practice would be necessary in grunting, snarling, screaming, in fact, in producing all discordant sounds. The inquirer will perhaps understand why this is not done, if he will make it plain to himself why Swedish gymnastics pays no attention to face-contortions, which would be just as reasonable. And if it be argued further that crimes are just as permissible as the wheels on the horizontal bar, for the reason that they would be possible, such a palpable sophism would prove to what straits the opponent is driven.

The constantly repeated reproach that German gymnastics amounts only to a drilling for show-exercises after the fashion of the circus-rider and tight-rope walker, that there is no essential difference between gymnastics and these feats of strength and juggling, is as unjust as it is thoughtless. It is extremely unjust, in view of the ingenious efforts made by the founders of the German system whose constant aim was a progressively systematic development of the body. The reproach is thoughtless, because they forget to tell us what a great misfortune it would be if each one of us, without accomplishing less in other directions as man or citizen, possessed the strength of Rappo, the nimbleness of the "india-rubber man," the horsemanship of Franconi, and the surefootedness of a Blondin. On the contrary, we would then be a formidable nation. Of course such a degree of physical development is esteemed very little by the people in general, and the followers of Ling would be glad to have German gymnastics subjected to the same contempt. Is it really necessary to explain that this contempt is not felt for the circus-rider, etc., as such, whose lives are centered in the applauding surprise of the multitude, but that this contempt is owing to the fact that they acquire their skill at the expense of human and civil excellences? It is not probable that a person who can only swim or skate will be highly esteemed. But I have never discovered that the veneration with which the name of Lord Byron or Dieffenbach was mentioned was less on account of the fact that the great poet was an expert swim-

mer, and that the gifted surgeon was one of the best skaters of his time. It is difficult to understand why it should be necessary constantly to point out such serious violations of logic in a system that claims to be so philosophical.

But I overstep the bounds I had determined on. I desired to engage in this discussion only so far as my opinion as that of a physiologist could be of value. Furthermore, German gymnastics has at different times been defended against the attacks of the followers of Ling in so clear and thorough a manner, and the hollowness of the Swedish system has been so convincingly demonstrated, that the result of the controversy could not for an instant be doubted if the truth were the sole question at issue.

But unfortunately it is not so easily settled. It was deplorable, but perhaps unavoidable, that the Prussian authorities, in 1819, dealt gymnastics its death-blow, inasmuch as they did not distinguish between gymnastics as a physical exercise and gymnastics as a political factor. Gymnastics itself brought about this purification. When later the cry about the bodily neglect of our youth became louder and louder, German gymnastics had reached its highest stage of perfection, and having been matured through quiet endeavors and verified by the experience of a generation it could from the purest of motives offer its services to the authorities. Instead of gladly accepting German gymnastics, the Prussian authorities have endeavored more and more decisively to crowd it out so far as they could by replacing it with the so-called "rational gymnastics." In my opinion, this has been done not only without any good and sufficient cause, but in opposition to numerous significant and obvious reasons, and it is those reasons which are drawn from physiology, and which are perfectly unanswerable, that I have here tried to present. In short, the youth have asked for bread, and the authorities gave them a stone. It does not appear that this was occasioned incidentally through some old prejudice, not yet quite overcome, that was entertained against German gymnastics on account of its political past. For although it is necessarily the case that good physical exercise should be in perfect harmony with all that is human, and beneficial to people of all shades of opinion, to all nationalities and races; although in consequence of the fact, that that which is specifically national can be put into such exercises only in an artificial way, because of a confusion of conceptions which is an established fact of history; nevertheless the Prussian authorities have themselves, in their enactment of 1860, brought gymnastics into close relation with national affairs. The authorities themselves have expressed the wish, and for this they deserve our praise, that a more unconstrained intercourse of the youth in the gymnasiums, while at play and on excursions, should be sanctioned after the manner that was customary originally on the "Hasen-haide;" and thence forward it seemed reasonable to assume that the former political offences should be forgiven and forgotten. But it matters not how the authorities fell into this error; the consequences of their action have been the cause of great sorrow to every friend of youth and physical culture.

First of all, the youth have spurned the proffered stone and have

endeavored to provide themselves with bread. Numberless gymnastic societies have been formed, not one of which follows the Swedish system. Even those who had received their training at the Central Royal Institute deport themselves, according to report, as savages do that had been only half converted. While under control of the missionary, they obey his commands; but as soon as they are out of his sight, they again become cannibals. When these gymnasts leave the institution, they take revenge, on account of the privations they were made to endure, on the first parallel bars by performing the shears after a forward dip or execute the turn-over with straightened arms.

Since then the authorities have worked toward an entirely different end than that which the exercising youth have in mind; they have hampered and hindered the development of bodily exercises, instead of ignoring them as they formerly did. The Central Royal Institute, instead of becoming the principal promoter of gymnastics, became the seat of a negative power that has declared a war of extermination against the German system, which it does not understand, but hates; a power which does not wield any great influence on account of intrinsic reasons, but is strong on account of its wealth and the sanction given it by the state, and whose irritability is perhaps increased through the consciousness that it cannot conceal from itself the fact that, in spite of long continued efforts its government is one which is supported and held together from without. The Central Royal Institute should be a nursery for the harmonious development of efficient teachers; instead of this, it sends forth its pupils, deprived of their original knowledge, and instructed in those things only for which the people, generally, care nothing. In the struggle against this power and against this impregnable bulwark—a prejudice—there have for years been striving in vain a great many estimable people, who might have been helpful in promoting organization. During all this time, and with such means, nothing permanent has been attained, according to the unanimous opinion of impartial and competent judges. It will come to pass that German gymnastics shall enter upon its inheritance, though it now, like the good child in the fable, is waiting before the door in a needy condition, while the step-child feasts and revels within. The day will inevitably arrive, sooner or later, on which the horizontal and parallel bars shall triumphantly enter Scharnhorst Street, and then it will be necessary to commence at the very beginning again. Finally, what a bad impression it must make outside of Prussia, at a time when an appeal is made throughout Germany for united action in things of much less importance, that Prussia alone, for the purpose of making hopeless experiment with a pale, exotic hot-house plant, should shun the shade of the hearty and mighty trunk which spreads its branches beyond Pregel and Saar, over the Eider and Bodensee, aye, over the ocean.

It is not sufficient for us to establish the truth, but we must also acknowledge that we have allowed ourselves to be misled for years. We must be ready to forsake those persons whose lives have shown them to be in perfect accord with the Swedish system and who never could be sincere friends of German gymnastics; in short, we must, by

manly effort, retrieve the lost ground so far as possible and correct past errors, especially when we are urged to do so on all hands. Even private individuals find this quite difficult, how much more difficult must it be for the authorities who must preserve the appearance of infallibility and of exclusive self-determination?

Let us, however, hope that they will yet prevail upon themselves to honor the truth. In proportion as we recognize how affairs have gradually reached the present complicated state, we shall give our hearty approval, and will, for youth's sake, be sincerely grateful.







